

ABSTRACT

A system and method are provided to extend the resolution normally achievable with nanoprnt lithography processes to facilitate the reproduction small features required for the production of integrated circuits. The present invention provides for creation of a translucent mask (or mold) with three-dimensional features. The vertical dimension of the three-dimensional features can be characterized as sidewalls. The present invention provides for depositing a light absorbing material as a thin film onto the surface of the mask or mold. After deposition of the light absorbing material the mask is further processed by etching or other similar techniques to remove the absorbing material from all horizontal surfaces, leaving only a thin coating of the absorbing material on the vertical sidewalls of the features on the mask. When a resist layer of a substrate is exposed by light passing through the mask, areas of the resist layer corresponding to locations of the vertical sidewalls of the mask will not be exposed as light in these areas is absorbed by the absorbing material. The balance of the resist layer will be exposed as light passes through the mask unobstructed. Exposure of the resist coated substrate leaves the resist either more soluble or less soluble in a particular solvent depending upon the resist. Further development of the resist and processing of the substrate results in either the removal or the retention of small areas corresponding to the thickness of the light absorbing materials deposited on the sidewalls of the features on the mask.